

# Notice of Allowability

Application No.

10/803,747

Examiner

Jerry Martin Blevins

Applicant(s)

GUNN ET AL.

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## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed May 15, 2006.
2. ☒ The allowed claim(s) is/are 1 and 3-16.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted: Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
**BRIAN HEALY**  
**PRIMARY EXAMINER**

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, see pages 6 and 7, filed May 15, 2006, with respect to claims 1 and 3-16 have been fully considered and are persuasive. The rejection of claims 1 and 3-16 has been withdrawn.

### ***Election/Restrictions***

This application is in condition for allowance except for the presence of claims 17-30 directed to inventions non-elected without traverse. Accordingly, claims 17-30 have been cancelled.

### ***Allowable Subject Matter***

Claims 1 and 3-16 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 1, the prior art, as best exemplified by non-patent literature to Yamada et al., "Crosstalk Reduction in a 10-GHz Spacing Arrayed-Waveguide Grating by Phase-Error Compensation", *Journal of Lightwave Technology*, Vol. 16, No. 3, teaches an AWG (Figure 1) disposed on a substrate (page 365, last full paragraph) comprising an input slab (slab waveguide directly above input waveguides) with a plurality of inputs and a plurality of outputs (inputs from input waveguides, outputs to arrayed waveguides), an output slab (slab waveguide directly above output

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waveguides) with a plurality of inputs and a plurality of outputs (outputs to output waveguides, inputs from arrayed waveguides) and a plurality of waveguides (arrayed waveguides) coupled between the input slab and the output slab, where each of the plurality of waveguides has a phase modulator (elements for phase adjustment) in the optical path, and has a predetermined optical path length difference with respect to an adjacent waveguide (page 364, last full paragraph), and wherein each phase modulator has an input for receiving a control signal (from input slab), and the phase modulator modifies the phase of light propagating through it in response to the received control signal (inherent property of phase modulator). However, Yamada, either alone or taken in combination with the prior art, fails to disclose or render obvious at least one photodiode coupled to one output of the output slab such that a light signal received by the at least one photodiode is optimized. Specifically, Yamada lacks the structural features necessary for optimization.

Claims 3-14 are allowed based on their dependence from allowed base claim 1.

Regarding claim 15, Yamada teaches a system for phase error compensation of an AWG (Figure 1) comprising a plurality of phase modulators (elements for phase adjustment), where each phase modulator has an input. Yamada does not teach a controller. US Pre Grant Publication to Yoo, number 2004/0037500, teaches an AWG (Figure 2) comprising a controller (56) with a plurality of inputs and a plurality of outputs, where each of the plurality of outputs is coupled to the input of a respective one of a plurality of phase modulators (46). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Yamada with the controller of Yoo. The

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motivation would have been to improve correction of phase dispersion (page 4, paragraph 41). Yamada also does not teach a plurality of photodetectors. US Pre Grant Publication to Welch et al., number 2004/0033004, teaches an AWG comprising a controller (RxPIC 10, page 19, paragraph 202) and comprising a plurality of photodetectors (Figure 5, elements 16) where each of the plurality of photodetectors is optically coupled to a respective one of a plurality of outputs of the AWG (Figure 5), and each of the photodetectors has an output coupled to a respective input of the controller (page 19, paragraph 202). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Yamada with the photodetectors of Welch. The motivation would have been to improve detection of the phase modulated light. However, Yamada, Yoo, or Welch, either individually or taken in combination with each other or with the prior art, do not disclose or render obvious that the controller communicates a control signal to the respective phase modulator and wherein each phase modulator modifies the phase of light propagating through it in response to the received control signal such that a light signal received by the at least one photodiode is optimized. Specifically, Yamada, Yoo, and Welch all lack the structural features necessary for optimization.

Regarding claim 16, Yamada teaches a system for phase error compensation of an AWG (Figure 1) comprising a plurality of phase modulators (elements for phase adjustment), where each phase modulator has an input and each phase modulator is in an optical path of a respective one of a plurality of arrayed waveguides of the AWG. Yamada does not teach a controller. Yoo teaches an AWG (Figure 2) comprising a

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controller (56) with an output and an input (not shown) and a plurality of outputs (to modulators 46. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Yamada with the controller of Yoo. The motivation would have been to improve correction of phase dispersion (page 4, paragraph 41). Yamada also does not teach a signal generator, a light source, a modulator, a photodetector, and a signal detector. Welch teaches an AWG comprising a controller (RxPIC 10, page 19, paragraph 202, Figures 64, 69, element 10) and comprising a signal generator (Figure 69, element 401) with an input and an output, a light source of a selected frequency, (Figure 64, element 302), a modulator (Figure 64, element 306) with an optical input, an optical output and a signal input, a photodetector (Figure 64, element 290) with an optical input and an electrical output, and a signal detector (Figure 64, elements 312, 314, which detect signal from generator 401, Figure 69), where: the output of the controller (10) is coupled to the input of the signal generator (Figure 69), the output of the signal generator is coupled to the signal input of the modulator (Figure 69, where the modulator is part of TxPIC 300, Figure 64), the input of the modulator is coupled to the light source (Figure 64), the output of the modulator is coupled to a selected one of a plurality of inputs to the AWG (Figure 64), the input of the photodetector is coupled to a selected one of a plurality of outputs of the AWG (Figure 64), the output of the photodetector is coupled to the input of the signal detector (Figure 69, where the photodetector is part of RxPIC 10, Figure 64), the output of the signal detector is coupled to the input of the controller (Figure 64, output of 300 coupled to input of controller 10), and each of the plurality of outputs of the controller is coupled to a

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respective one of the plurality of phase modulators (Figure 69, where the modulator is part of element 300). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Yamada with the above structures of Welch. The motivation would have been to improve detection of the phase modulated light.

However, Yamada, Yoo, or Welch, either individually or taken in combination with each other or with the prior art, do not disclose or render obvious that each phase modulator modifies the phase of light propagating through it in response to the received control signal such that a light signal received by the at least one photodiode is optimized. Specifically, Yamada, Yoo, and Welch all lack the structural features necessary for optimization.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMB

  
**BRIAN HEALY**  
**PRIMARY EXAMINER**